



AP/ 1772
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Patent Examiner: Michael C. Miggins:

Group Art Unit: 1772

In re application of:

JOEL L. SEREBOFF

Serial No.: 09/923,991

Filed: August 7, 2001

: **GEL FILLED TRAUMA MITIGATION
: DEVICE AND COMPOSITION
: THEREFORE**

: Attorney Docket No. 192390-00053

APPELLANT'S REPLY TO EXAMINER'S ANSWER DATED JUNE 3, 2004

July 30, 2004

Commissioner For Patents
MAIL STOP APPEAL BRIEF - PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a Response to the Examiner's Answer dated June 3, 2004.

The Invention

The present invention provides a device that helps to dissipate the energy of an impact rather than allowing the energy to be transmitted directly to protected subjects (e.g., occupants of a vehicle). The trauma-mitigating effects are provided by a laminar (flat layered) device, sometimes referred to herein as a "laminate." Such devices may be produced in various thicknesses, preferably 9 cm and less. The elements of the laminar device have cumulative effects in protecting the subjects when an impact occurs. The laminate is intended to minimize damaging forces which may be transmitted to the lower limbs and other body parts. One function of the laminate is to undergo deformation, converting to heat the energy generated. A second function of

the laminate is to minimize the force conveyed to the subject's anatomy by spreading it over as wide an area as possible.

Some layers in the laminate compress and deform when forces are applied. Other layers respond at the point of contact to distribute the force over an area of the device. Internal to one of the layers, elements within a viscous fluid interact to dissipate forces. In certain embodiments, the laminate is located on and integral to the footwell or toepan surface. It could also be used on the knee bolster to protect the driver and front seat passenger.

In its most general form, the laminate of the present invention comprises an enclosed crushable structure adapted to deform in a predetermined manner upon sudden impact. The enclosed crushable structure comprises a fluid-impervious flexible enclosure containing a crushable matrix bathed in a highly viscous fluid composition. The crushable matrix desirably comprises a multiplicity of matrix elements arrayed within, and each disposed generally perpendicular to, the principal plane of the laminate. These matrix elements may, for example, be cylindrical, hemispherical or pyramidal, or a mixture thereof. Preferably some or all of the matrix elements are formed of a pair of hemispheres or pyramids secured together at a convexity or an apex. Optionally, some or all of the matrix elements are provided with a multiplicity of crushable arms extending therefrom. Optionally, the hemispherical or pyramidal elements may be used in combination with cylindrical elements.

Optionally, the enclosed crushable structure includes a thin supporting layer above and/or below the multiplicity of matrix elements. Such a supporting layer may be a ductile metal such as aluminum or copper, in a corrugated or other crushable shape, or it may be cast or otherwise fashioned as a corrugated, honeycomb or similar shape of polymeric material, having a rubbery or solid consistency, or it may be entirely or partly of ceramic or ceramic alloy. Alternatively, such a thin supporting layer may be sandwiched outside the enclosed crushable structure.

The fluid-impervious flexible enclosure that encloses the enclosed crushable structure may be of polymeric film or of rubberized or elastomeric woven or nonwoven fabric of suitable toughness to withstand expected forces without rupturing. The enclosure is preferably formed of a pair of parallel 20-mil-thick rubberized, fluid-

impervious barriers. These barriers may optionally be formed of a single sheet folded over itself. They may be joined together by a somewhat thinner film (*e.g.*, 10 to 15 mil) along some or all of the periphery. One or more edges of the enclosure preferably have one or more accordion pleats (gussets) to accommodate percussive expansion along the plane of the laminate.

The highly viscous fluid composition is enclosed in the fluid-impervious flexible enclosure. The composition comprises a viscous fluid having a viscosity from about 300,000 CPS to about 6 million CPS (*i.e.*, semi-solid, such as a gel or block polymer). When there is an impact on a device of the present invention, the crushable matrix interacts with the viscous fluid to transfer energy thereto or therein, generating movement of the elements within the viscous fluid and movement along the plane of the laminate and also dissipating energy in the form of heat.

Preferably, the highly viscous fluid also comprises low-density microsphere particulates, having a diameter of about 100 to 400 microns. Such microsphere particulates may be ceramic or plastic, or a mixture of both may be used. More preferably, the highly viscous fluid comprises macrosphere particulates, *e.g.*, a foamed polymer such as polystyrene, having a diameter of about 0.5 mm to 5 mm, either alone or in combination with microspheres. Desirably, particulates of various sizes comprise 20% to 40% of the highly viscous fluid by volume. When there is an impact on a device of the present invention, the crushable matrix interacts with the particulate components of the viscous fluid to transfer energy thereto.

The fluid-impervious flexible enclosure may comprise a polymer film of suitable thickness and toughness to maintain its integrity through the expected impacts, or it may be made of two or more plies comprising fabric or elastomer. One such ply may be of polynorbornene or butyl rubber, to provide softness and additional resiliency. Major portions of the enclosure may optionally be made by coextrusion, *e.g.*, of polymer film and metallic film.

For adherence to metal, *e.g.*, the floor of a vehicle or a thin crushable layer of ductile metal as described hereinabove, a metal-adhering film such as XU661126.02 (Dow Chemical Co., Midland, MI) may be employed. Additionally, the enclosed crushable structure may be surmounted by a layer of fully reticulated foam. A source of

pressurized air is provided so that when an impact (sudden deceleration or acceleration) is sensed, the foam layer is pressurized.

Argument

In the Answer, the Examiner has restated the reasons for the rejections of the claims. The rejections are addressed in the Appellant's initial Brief. The Examiner has further provided a response to two of Appellant's arguments. That is, the Examiner contends that the definition of a "matrix" provided by Appellant is too narrow and that the definition of a "matrix" would also encompass foam. The Examiner further contends that the standard for determining how art may be combined to support a rejection under 35 U.S.C. § 103(a) is that any art may be used to support such a rejection so long as nothing suggests that the art cannot be combined.

With regard to the first response, Appellant again notes that the applicable definition of *matrix* is, "something resembling a mathematical matrix especially in rectangular arrangement of elements into rows and columns." See, Merriam-Webster Online Dictionary at, <http://www.m-w.com/cgi-bin/dictionary> (attached as Appendix 1). It is, of course, long established that Applicants may be their own lexicographer, as long as a term in a claim is not given a meaning repugnant to the usual meaning of that term. See, *In re Hill*, 161 F.2d 367, 73 U.S.P.Q. 482 (CCPA 1947). In this application the specification and figures constantly describe and show that a "matrix," as used in the claims, is a series of organized elements disposed in a repeating pattern. As such, the configuration of elements recited by the claims is embraced by the definition noted above and it is of little note that the Examiner has located another, but unrelated, definition. Therefore, the *Jordan* reference cited by the Examiner does not disclose a matrix disposed within an enclosure as is recited by the claims of the present invention. Accordingly, the Examiner's rejection of claims 1 and 21 under 35 U.S.C. §102(b) as set forth in the November 5, 2003 Office Action is in error.

With respect to the Examiner's second Argument, the Examiner has asserted that the *Moore* and *Jordan* references may be combined because, "there is nothing

which suggests the tubes of *Moore* cannot be disposed within the fluid of *Jordan* while keeping the fluid out of the tubes and one would have been motivated to combine *Jordan* and *Moore* in order to provide improved impact resistance.” Answer at 15. To support the assertion that unless two references suggest that they cannot be combined, the combination is obvious, the Examiner cites *In re Kelly*, 642 F.2d 413 (CCPA 1981). *Kelly* does not set forth or imply such a rule. *Kelly* states that:

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, **the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.**

Id. at 425 (emphasis added). Moreover, the holding of this older case must be interpreted in view of subsequent holdings such as *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q.2d 1276 (Fed. Cir. 1987), which stated that, “obviousness cannot be established by combining teachings of the prior art to produce the claimed invention, *absent some teaching, suggestion, or incentive supporting combination*” (emphasis added). Thus, contrary to the Examiner’s interpretation that the only time references cannot be combined is when the references teach away from a combination, the actual rule for combining references to support a rejection under 35 U.S.C. § 103(a) is that the references *must* have some teaching, suggestion, or incentive supporting combination. In this application, there is no suggestion that any of cited references should be combined.

Conclusion


It is respectfully submitted that claims 1 and 21 are not anticipated by *Jordan*. It is further submitted that claims 4 and 23 are patentable over *Jordan*. It is further submitted that claims 2 and 3 are patentable over *Jordan* in view of *Courtney*. It is further submitted that claims 5-6, 11, 13, 15 and 17 are patentable over *Jordan* in view of *Moore*. It is further submitted that claims 7-10 are patentable over *Jordan* in view of *Moore* and further in view of *Jensen et al.* It is further submitted that claim

22 is patentable over *Jordan* in view of *Sobel*. It is further submitted that claim 12 is patentable over *Jordan* in view of *Moore*, and in further view of *Sobel*. It is further submitted that claim 14 is patentable over *Jordan* in view of *Moore*, and in further view of *Weller*. It is further submitted that claim 24 is patentable over *Jordan* in view of *Weller*. It is further submitted that the Examiner is using an improper definition of "matrix" to support the rejections. It is further submitted that the Examiner is applying an improper standard for combining references under 35 U.S.C. § 103(a). Therefore, it is requested that the Board reverse the Examiner's rejections of Claims 1-15, 17 and 21-24 and remand the application to the Examiner for the issuance of a Notice of Allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. C. Jenkins', written over the typed name.

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matrix
augmented matrix
diagonal matrix
dot matrix
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identity matrix



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matrix

Main Entry: ma·trix ◀▶

Pronunciation: 'mā-triks

Function: *noun*

Inflected Form(s): *plural* **ma·tri·ces** ◀▶ /'mā-trĭ&-"sēz, 'mā-/; or **ma·trix·es** ◀▶ /'mā-trĭk-s&z/

Etymology: Latin, female animal used for breeding, parent plant, from *matr-*, *mater*

1 : something within or from which something else originates, develops, or takes form

2 a : a mold from which a relief surface (as a piece of type) is made **b** : **DIE** 3a(1) **c** : an engraved or inscribed die or stamp **d** : an electroformed impression of a phonograph record used for mass-producing duplicates of the original

3 a : the natural material (as soil or rock) in which something (as a fossil or crystal) is embedded **b** : material in which something is enclosed or embedded (as for protection or study)

4 a : the intercellular substance in which tissue cells (as of connective tissue) are embedded **b** : the thickened epithelium at the base of a fingernail or toenail from which new nail substance develops

5 a : a rectangular array of mathematical elements (as the coefficients of simultaneous linear equations) that can be combined to form sums and products with similar arrays having an appropriate number of rows and columns **b** : something resembling a mathematical matrix especially in rectangular arrangement of elements into rows and columns **c** : an array of circuit elements (as diodes and transistors) for performing a specific function

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6 : a main clause that contains a subordinate clause

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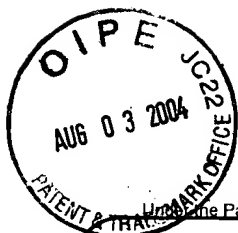
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	First Named Inventor	Joel L. Sereboff
	Art Unit	1772
	Examiner Name	Michael C. Miggins
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